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ALUMINUM LEADER GAINS  
EQUIPMENT IMPROVEMENTS,  
COST SAVINGS WITH

## LUBRICATION EXCELLENCE PROGRAM



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EQUIPMENT IMPROVEMENTS,

# COST SAVINGS

WITH LUBRICATION EXCELLENCE PROGRAM

Sam Deters

**N**ovelis is a leading producer of flat-rolled aluminum products and the world's largest recycler of aluminum. Opened in 1959, the Terre Haute, Indiana, facility is a world-class light gauge aluminum rolling plant and a recognized leader in the production of semirigid foil container stock and wide industrial fin stock.

To ensure that a plant with a 60 year history continues to meet the standards for quality and operational excellence, the company had to change its views on lubrication, as lubrication-related equipment failures were plaguing the mill. The reliability team began implementing multiple lubrication excellence programs, which have resulted in improved uptime, cost savings and safer conditions. To begin the process, the reliability team utilized industry experts to conduct a plant study and identify opportunities for improvement.

## Inventory and Storage

The first course of action was to inventory what was in the plant. For one week, the facility held a rapid improvement event (RIE) and performed a lube scavenger hunt. Some of the findings, shown in Figure 1, included oils and greases stored everywhere and in all kinds of containers! As Figure 2 shows, the mill was using milk cartons as dispensing containers. The plant discarded 1,200 gallons of waste oil, 1,200 pounds of grease and 45 empty barrels, totes and kegs, and freed up 10,000 square feet of storage space. The effort also included compiling a list of lubricants needed, discarding what wasn't needed and organizing lubricants into a central storage area.



Figure 1: Initial state of area with several various containers holding oils



Figure 2: Milk cartons and other containers



Figure 3: New lube room

The reliability team and industry experts saw a significant opportunity to improve storage and handling practices. The major challenge was the large assortment of suppliers and lubricants in totes, which resulted in excessive inventory levels. In the end, the plant moved from 50 different oils and greases and 10 vendors down to 19 lubricants and two suppliers.

### Climate Control

In addition to organizing lubricants and improving inventory management, the development of a new lube room allows the facility to control its storage climate. Before, it stored some bulk lubricants outdoors in a covered area, which exposes these lubricants to moisture, debris and a broad range of temperatures throughout a central Indiana year. Small amounts of moisture and debris travel with the lubricant to machinery and is destructive in a lubrication system. To combat this, the plant implemented sealable refillable containers, bulk storage with filtration and filter carts to top-up lubricant reservoirs. In addition, to ensure the integrity of lubricants moving forward, a standard for filtration was set and aligned with ISO cleanliness codes on bulk storage.

“As part of the lubrication excellence program, efforts to reduce leaks resulted in a **75 percent decrease in one year**”

### Fork Truck Shop

Incorporated into the lube room is the fork truck shop. Filtered lubricants for engine oil changes, transmission oil changes, differentials and hydraulic system top-ups are piped to the truck shop through hose reels. This new routing eliminates the need for a mechanic to push barrels around or handle sealable refillable containers around the shop, which reduces the risk of injury.

### Reducing Leaks

Hydraulic oils that leak into rolling oils in a cold rolling aluminum facility can cause significant problems. They can slow down running speed, impact metal quality and result in a costly coolant cleaning process. excellence program, efforts to reduce leaks resulted in a 75 percent decrease in one year. The primary action? A culture change – the reliability team helped all employees understand that leaks were no longer acceptable. Employees were encouraged to speak up when they saw a leak and a plan to address the leak was identified as soon as possible, either through unplanned work or through a planned outage.



Figure 4: New lube room

### Hydraulic Oil Management

In addition to reducing hydraulic oil leaks, the reliability team also developed a plan to maximize overall service life. Hydraulic oil service life increased by keeping it clean, cool and dry.

Housing the oils in the lube room was the first step. From there, the plant implemented operational checks of the hydraulic systems to alert the team when a filter required changing. Operational checks also alert the team when temperatures rise too high, which cause higher rates of oxidation and break down the oil.

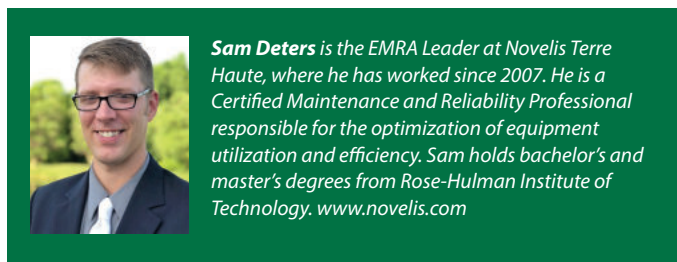
New air cooled heat exchangers were installed to eliminate the possibility of water entering hydraulic systems. These air cooled systems are more efficient at maintaining proper oil temperatures because the facility's water would foul the heat exchangers quickly. Desiccant breathers installed on the reservoirs also help to keep moisture out on days when the weather is hot and muggy.

The improvements in hydraulic oil service life resulted in significant cost reductions for hydraulic parts, like pumps, cylinders, valves, seal kits, etc. From 2015 to 2017, Novelis Terre Haute reduced these costs 65 percent.

### Lubrication Task Management

Along with these changes to equipment and the storage process, the team conducted a lube point audit to build a lube point list. From the lube point list, it implemented a lubrication task routing tool to ensure that the plant's lube technician had accountability for all lube points on a regular basis.

The program catalogs each lubrication point with a schedule, specific lubrication and the practices necessary for the task. This program allows the team to fine-tune the schedule using calculations that identify the proper amount and timing for grease applications. This ensures effective and efficient equipment lubrication. In fact, the plant saved significant costs in oil and grease expenses after implementing the program. The plant team continues to focus on lubrication excellence, driving towards reduced unplanned downtime and long-term operational excellence.



**Sam Deters** is the EMRA Leader at Novelis Terre Haute, where he has worked since 2007. He is a Certified Maintenance and Reliability Professional responsible for the optimization of equipment utilization and efficiency. Sam holds bachelor's and master's degrees from Rose-Hulman Institute of Technology. [www.novelis.com](http://www.novelis.com)

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